

MCKENZIE, N. L. AND ROBINSON, A. C. (Eds), 1987. A biological survey of the Nullabor region South and Western Australia in 1984. SA Department of Environment and Planning, WA Department of Conservation and Land Management and Australian National Parks and Wildlife Service.

MCKENZIE, N. L., BELBIN, L., MARGULES, C. R. AND KEIGHERY, G. J., 1989. Selecting representative reserve systems in remote areas: a case study in the Nullarbor region, Australia. *Biological Conservation* 50: 239-61.

RECHER, H. F., 1990. Wildlife conservation in Australia: State of the nation. *Australian Zoologist* 26: 5-11.

SAMPSON, J. F., HOPPER, S. D. AND COATS, D. J., 1990. *Eucalyptus rhodantha*. Western Australian Wildlife Management Program No. 4. Department of Conservation and Land Management: Como.

Wildlife Conservation in Australia: Prophesies of Doom

Harry F. Recher

Department of Ecosystem Management, University of New England, Armidale, NSW 2351

Am I a prophet of doom? Is there no hope for the future of Australia's wildlife?

The answer to both questions is no! In my paper on the State of the Nation (Recher 1990), I presented what I consider to be a view of wildlife conservation in Australia as it is in 1990 and made predictions of future events which are consistent with trends in the decline of the continent's biota over the 200 years of European settlement. If those views appear pessimistic or despairing as put by Andrew Burbidge and Steve Morton, then so be it. That is the way things are and that is the way they will be unless we significantly change the way we use and manage the nation's resources. Support of my position is given in the statements by Denis Saunders, John Pickard and Pat Hutchings. If anything, Hutchings and Pickard take me to task for ignoring vast areas of the continent requiring urgent attention by conservationists and land managers. The Minister of the Environment in New South Wales, Tim Moore, justifies my position when he states that I raised issues which "go beyond immediate and instinctive government policy" and that there is "a clear need [for government] to make commitments that go beyond the life span of single Parliaments or Governments". It is not that we lack the knowledge or skills to arrest the decline of Australia's flora and fauna, but we do lack the political resolve and national leadership to apply that knowledge and those skills.

The reality of wildlife conservation in Australia is explicit in Philip Reed's (this volume) comments on John Whitehouse's (1990) paper: in 200 years of European colonization the continent has experienced massive environmental degradation and the destruction continues.

As George Wilson points out, the message is getting through to the wider community. However, unlike Wilson and Burbidge I am not convinced that the issues are understood or that the need for urgent action to resolve global, as well as Australian, environmental problems has yet been appreciated by key leaders in government and industry. Nor do I have any evidence that the general public is aware of, or concerned about, environmental issues other than those, such as Greenhouse, which have a high media profile. And these, as evidenced by the persistent confusion between the Greenhouse Effect and the thinning of the Ozone Layer even by university students, are not understood! Too many conservationists suffer from the same myopia that afflicts many intellectuals — they never talk with real people. It is a risk that all well-educated and dedicated individuals take when they assume that their conversations with colleagues and friends represent the views of the silent majority. I can assure them they do not! The silent majority remains serenely oblivious and, probably, uncaring of local, national and global environmental problems.

The depth of this problem is illustrated by recent surveys of first year students at Macquarie University and the University of New England. Andrew Beattie, Professor of Biology at Macquarie, was concerned about the emphasis or lack of emphasis placed on the study of biology (including environmental issues) in school. He therefore asked his first year students whether or not they had been encouraged to study biology and whether or not they thought that they had sufficient background in biology to make wise decisions about important contemporary biological and environmental issues. I asked my students entering the courses of natural resource management and urban and regional planning at

Armidale the same questions. Of 400 biology students at Macquarie only 32% had been encouraged to do biology, while only 18% of our future resource managers and planners had been similarly encouraged. At both universities about twice as many students wound up studying biology as had been encouraged to study the subject. Considering that all resource management, planning, and government is the management of a highly complex biological system, it is tragic and frightening that so little emphasis is placed on the study of the biological sciences. In comparison 79% of the 135 students in my course had been encouraged to do maths. Only 20% of all the students surveyed considered that they had been adequately prepared to understand major biological and environmental issues. Of even greater concern, only 5% thought that their friends entering disciplines such as business, law, and politics had sufficient background to understand environmental issues. As another comment on environmental awareness within the wider Australian community, only 29% of future resource managers (N=73) and 16% of future planners (N=55) at Armidale thought they could name or identify more than 20 species of native birds.

The students at Macquarie and Armidale are a better measure of community awareness and understanding of the environment and environmental issues than the views of my professional colleagues. We have a long way to go before I will be satisfied that Australians are informed about, understand and are prepared to deal with contemporary environmental problems. Until then I think there is an important need to talk to and educate the public by every means possible including, if need be, to alarm them sufficiently that they pay attention. Many of my more conservative colleagues fail to understand that you must first grasp the attention of people before you can get them to listen. The real joy of the Greenhouse Effect is that it scares people. Its message and its threats are simple, direct and unavoidable. Greenhouse and the media hype surrounding it and the thinning of the ozone layer have done more to stimulate public concern for the environment, for our forests and for wildlife conservation than any issue, including all the numbats, woodhens and whales in the world, since Rachel Carson (1962) brought toxic chemicals to American kitchens.

Americans did not know that the birds and butterflies in their backyards had disappeared and the spring was truly silent. I know they didn't because I was there. It took Carson's moving and emotional account to reach the minds of middle-class America and decade of lawsuits before even the most toxic and persistent pesticides were removed from American supermarkets. The warnings and concerns of the scientific community were there

long before that (concern about the widespread use of DDT was voiced as early as 1946), but the whispers in Ministerial ears and the technical reports in scientific journals failed. It required and, it still requires, strong public comment from the Rachel Carsons and Paul Ehrlichs of this world to bring environmental sanity into the market place. I agree that we have made progress and that there is a greater level of environmental responsibility on the part of individuals, industry and government than ever before, but it is not good enough and it will not persist and grow without continued strong media reporting. The trouble with whispers in the hallowed halls of government is that the people who count, the people who have the most to lose, never hear them.

I do not see any commitment on the part of government in Australia to address the politically difficult problems of land clearing, misuse of agricultural chemicals and fertilizers, over-fishing, the continued logging of old growth forests, or coastal development much less addressing the urgent need of global and national population control.

Wilson refers to the National Conservation Strategy as an example of change in the right direction, but where is it? Bureaucrats in New South Wales have successfully stonewalled the adoption of a State Conservation Strategy and their Western Australian analogues adopted a watered down version of a State Conservation Strategy when the first draft of a state environmental statement was found to be too realistic. If government was serious about a National Conservation Strategy, there would already have been a five year review of progress and significant fine tuning of goals and objectives. There would now be a clear temporal framework for achieving national conservation goals.

It would do us all well to realize how significantly the final document was changed in wording from the penultimate draft to the published strategy. The people who made the changes are the same key leaders of government and industry who have yet to come to understand national and global environmental problems. These are the people committed to sustained, if unsustainable, growth and who insist on measuring progress in monetary terms rather than in terms of the important quality of life criteria of clean air, clean water, clean food, clean land and the freedom opportunities provided by open space and the diversity of life forms which share Planet Earth with us. Until these people change, or until they are replaced by individuals who understand ecological processes and can understand the interdependence of all life on Earth, I will continue to present a critical and realistic, not pessimistic, assessment of the State of Australia's environment. I am not pessimistic, because we do not need to wait for new technology to resolve national and global problems. We need only find

the will to manage our resources in an environmentally responsible fashion and we know pretty much how to do that.

Why then is there such an apparent divergence in views between myself and Andrew Burbidge and to a lesser extent between myself and George Wilson and Steve Morton? Have they simply misunderstood my position or does the position put most strongly by Burbidge represent an alternative and more constructive approach to wildlife conservation than my more "alarmist" and critical position?

As a way of answering these questions, I need to consider the following points:

1. *taking an alarmist position and presenting frightening views of the future discourages people and governments from doing anything. That is, the prophet of doom is self-fulfilling.* I agree that there is a risk. The risk is not that people will give up — they will fight harder — but, that key individuals in government and industry will use it as an excuse to continue business as usual with no concern for long-term environmental effects. However, it is my thesis that these people would have done that anyway and that it is probably impossible to persuade them with sweet reason and whispered advice to change their attitudes or behaviour patterns and make them environmentally responsible. They will act in an environmentally responsible fashion only when forced to do so by a concerned and determined community. The community will remain concerned and act to force change in government only so long as they remain aware of environmental issues and understand how they and their children are affected by pollution and environmental change.

We must remember that the prevailing pattern in government bureaucracy over the past 20 years has been to withhold information from the community, regardless of risks to the environment and the health of people, and to deny that there are problems. As John Pickard points out, government departments and the individuals employed in those departments are more often responsible to the industries they serve than the people who pay their wages through taxes. When things start to get better, I will be among the first to tell them, but I will also warn them not to relax.

2. *significant progress has been made in wildlife conservation over the past 20 years.* I agree that we are now in a much better position to manage the nation's biota than at any time in the past. We have a good, if imperfect, understanding of major ecological processes and the ways in which plants and animals are affected by human activities. There have been noteworthy successes in saving individual species, such as the Numbat and Lord

Howe Island Woodhen, from extinction and a start has been made on the development of plans of management for forest wildlife (e.g., Recher *et al.* 1980, 1987).

Despite these outstanding achievements, much more remains to be done. Our knowledge of reptiles, amphibians, native fish, invertebrates and invertebrate communities is poor with most national emphasis focussed on mammals and to a much lesser extent on birds. For all the progress on individual species or on high profile environments, such as rainforests, 90% of Australia's biota remains a conservation backwater. With the possible exception of Victoria with its legislation to control clearing and the adoption of a Flora and Fauna Guarantee Act, no state has addressed the problem of wildlife conservation and management on private land. Apart from studies of high profile species, such as Koalas, Mallee Fowl and Woodhens, and of pest species, such as kangaroos and fruit bats, wildlife research by government departments in New South Wales has contracted over the past decade. Given its possible long-term impact on forest ecosystems, studies of fire ecology and, especially prescription or controlled burning, are virtually no-existent. For all the progress over the past 20 years in wildlife conservation, the list of organisms, habitats and land use practices requiring urgent study is far greater and a cause of concern.

Burbidge calls for adequate funding for wildlife research and management. That need extends to maintaining a strong tertiary education system with a capacity to carry out both applied and pure research. I see no evidence of this happening. Indeed, a very large number of senior academics throughout Australia have expressed concern over staffing, declining research support, deteriorating facilities and lack of students undertaking post-graduate training in the sciences. Surely this poses significant problems for the future of wildlife conservation and management of Australia's flora and fauna. All the good work of the past 20 years is at risk of disappearing in the anti-intellectual vacuum of Australian government. We are finding it difficult to obtain trained staff for teaching and research. In disciplines, such as entomology, the situation is already at crisis levels with no training programmes and an active rundown of existing entomology research units by government.

If Australia plans to benefit from the progress in wildlife conservation made in the past two decades, it will need to invest much more in the future.

3. *a community or ecosystem approach to wildlife conservation is preferred to the current emphasis on single species management.* This is a point on which I have been misunderstood before and it may be that I have not expressed myself clearly. I do not suggest that

we allow any species to go extinct or that there is no benefit from studies of individual species. I fully support Burbidge's comments that studies of individual species provide data for the management of a wider range of associated organisms and that high profile species, such as Koalas and Numbats, can be used to generate community support for conservation in the broadest sense.

However, saving individual species can create a public impression of overall success and progress in wildlife conservation. The recovery of the North American Whooping Crane during my life time (50 years) did not prevent the extinction of the California Condor in the wild nor did it stop the virtual destruction of the Everglades in southern Florida by the diversion of critical water supplies to a growing human population and its wants for green lawns and clean cars. I'm sure a similar analogy could be made for the Numbat and the growth of Perth.

I do not want to choose between the recovery of individual species and the conservation of entire ecosystems. We should not be required to do so. I am concerned that we continue to place too much emphasis on endangered flora and fauna and not enough on the management and conservation of habitats. The risk is that we will save the few at the cost of the many, and the conspicuous at the cost of the inconspicuous. Both approaches are necessary and both should proceed concurrently, but just at the moment it is easier to obtain funding for endangered species research and management than it is for habitat conservation or for studies of tomorrow's endangered species. An analogy can be made with the current programme to plant a billion trees in this decade. Without question this is a desirable objective and one which will produce considerable environmental benefit. However, it seems almost futile so long as we continue to clear trees at a rate faster than they can be planted.

It is a matter of resources. Australia has too few wildlife scientists and provides too little support for wildlife research, conservation and management. The question should be "what is the most efficient way to use these resources?" and not "what species is most endangered?". We need to move away from crisis management to long-term planning and anticipation of problems. This requires not only additional funding, but new ways of managing research and new ways of measuring success. It is virtually impossible to initiate and maintain long-term research studies where the results may not be published during the working lives of the people doing the work.

4. *there is no value to national parks.* National parks are important (Recher 1971) and there is an urgent need

to reserve many more and much larger areas as parks and nature reserves. Even in Western Australia and New South Wales where much progress has been made in the past 25 years, the area of parks is less than 5% of the area of the state and large regions are unrepresented in the reserve system. In Western Australia the largest areas are in the most arid habitats and the rich forests of the south-west are poorly conserved. In New South Wales there is an abundance of parks along the well-watered coast and in the more rugged forests of the high country, but virtually nothing in the lands on the slopes and plains most extensively modified by agriculture. As Whitehouse (1990) points out, the system of selecting national parks in New South Wales has not been based on any scientific criteria of needs for nature conservation. Even where parks are abundant they may not be sufficient to stop the loss of species with long-term changes in climate even ignoring the likely consequences of rapid climatic change with Greenhouse.

This does not mean that our existing parks and reserves are useless or that no new ones should be established. To the contrary it means that more are required, but in addition there is a need to more fully integrate all forms of land use with the requirements of nature conservation. Hence, my view that we need to look seriously at multiple-use parks as a supplement to the existing (and expanded) system of parks and reserves. We need to manage wildlife on all lands regardless of tenure, but this requires significant changes in community and political attitudes to land ownership and the social responsibilities of land owners. I don't want to appear timid or tentative about this, but the changes in attitude required of government, individuals, industry and environmental groups are significant and considerable national leadership from Canberra is required. I just do not see that leadership coming forward.

5. *what is different about Western Australia?* Western Australia is different from the other states. It does have a much more effective wildlife conservation programme than the rest of Australia and it is worth briefly exploring why this has been so. The small population size of Western Australia and its concentration in Perth has resulted in a much more coherent and integrated scientific community. Individual scientists, such as Andrew Burbidge and Denis Saunders, have been able to significantly mold and influence community and government attitudes to wildlife conservation to a much greater extent than has been possible in other states. Their influence may be largely a legacy of the pioneering work of Bert Main. The influence of these individuals is not solely a function of numbers and isolation, but is also a reflection of their individual skills as scientists and their capacity as community leaders. Such leadership

has been conspicuously lacking elsewhere in Australia, which brings me to my final comment.

6. *education and scientific responsibility.* Australia's scientists have been conspicuously silent on the environmental and conservation problems facing the nation. There are many reasons for this including fear of losing jobs or research support, an aversion to communicating in simple language with the public or in dealing with the media, and the way scientists are trained. Scientific training in Australia is highly specialized with little or no exposure to the humanities and emphasizes communication with other scientists at the expense of communicating with the lay public. Scientists are trained to rely on facts and not to go beyond their experimental results. As a consequence, most scientists are not very good at making predictions or getting involved in social or environmental issues where predictions are needed and the data base is incomplete. Far from being virtues, these attributes of Australian scientists make it too easy for them to be captured by vested interests and manipulated by ill-informed and scientifically illiterate politicians.

The results are a lack of understanding within the community of the importance of research and education for the betterment of the nation and the prevalence of uninformed debate and conflict on environmental issues within the media and between environmentalists, govern-

ment and developers. Australia's scientific community has a much more important role to play. Until more scientists are prepared to speak up and to explain their findings to the public, progress in wildlife conservation will be hesitant and largely ineffectual as measured, not by today's wildlife scientists, but by future generations of Australians who will inherit a much poorer land.

REFERENCES

CARSON, R., 1962. *Silent Spring*. Houghton-Mifflin: Boston.

RECHER, H. F., 1971. Do we need more national parks? *Search* 2: 22-26.

RECHER, H. F., 1990. Wildlife conservation in Australia: state of the nation. *Aust. Zool.* 26: 5-11.

RECHER, H. F., ROHAN-JONES, W. AND SMITH, P., 1980. Effects of the Eden Woodchip Industry on Terrestrial Vertebrates with Recommendations for Management. Forestry Commission of NSW Research Note No. 42.

RECHER, H. F., SHIELDS, J., KAVANAGH, R. AND WEBB, G., 1987. Retaining remnant mature forest for nature conservation at Eden, New South Wales. Pp. 177-194 in *The Role of Remnants of Native Vegetation* ed by D. A. Saunders, G. W. Arnold, A. A. Burbidge and A. J. M. Hopkins. Surrey Beatty & Sons: Chipping Norton.

WHITEHOUSE, J. F., 1990. Conserving What? — The basis for nature conservation reserves in New South Wales 1967-1989. *Aust. Zool.* 26: 11-21.

Reserve selection in New South Wales: Where to from here?

R. L. Pressey

National Parks and Wildlife Service of New South Wales, P.O. Box 1967, Hurstville, NSW 2220

INTRODUCTION

In the previous issue of this journal, John Whitehouse presented an historical perspective of the development of the reserve system in New South Wales and its underlying rationale (Whitehouse 1990). For several decades, the notion of representativeness has been an explicit goal of reserve selection in this state. The National Parks and Wildlife Service and the authorities which preceded it have recognized that the reserve system should represent the full range of the state's biophysical diversity, whether this diversity is defined by geology, geomorphology, species, vegetation types or those ill-defined entities called ecosystems (see Strom 1979 and annual reports of the Service). The same fundamental goal is a basis for conservation efforts internationally (e.g., IUCN 1980) and is stated in the National Conservation Strategy for Australia (Anon. 1984). Whitehouse makes two important points about the achievement of this goal in

New South Wales, which apply equally well to other states and other countries: first, the apparent adequacy of the reserve system and the areas selected for new reserves depend very much on the way in which biophysical diversity is defined; and, second, progress towards a fully representative reserve system is less direct when opportunism replaces a more systematic programme for reserving natural features. The issues of a suitable data base and a systematic procedure for reserve selection deserve much more discussion and are explored further in this article.

Data Bases for Reserve Selection

Ideally, the data base for biological conservation would consist of comprehensive information on the distribution, abundance and habitat requirements of all the species and infraspecific variants in a region. In reality, such information is never available when decisions on the